More specifically, independent Claims 1-10, 31, 33, 149, 161 and 173 specifically recite first and second leveling films and that the second leveling film is thicker than the first leveling film. As explained in the present application, this feature is highly advantageous for leveling the surface over a wiring.

In the Office Action, the Examiner admits that "applicant's admitted prior art" does not show the second leveling layer over the first leveling layer. The Examiner, however, cites Chen as showing a second leveling layer 42 over a first leveling layer 40 and contends that Chen teaches that the thickness of the first leveling film 40 is 2000 to 3000 Angstroms (citing Chen, col. 6, lns. 1-10) and is thinner than the thickness of the second leveling film 42 (which the Examiner contends is 4000 to 6000 Angstroms, citing Chen, col. 6, lns. 53-54). The Examiner then states that both first and second leveling films are formed by spin coating and by the same material, citing Col. 6, ln. 30 in Chen.

As explained below, Applicants respectfully submit that the Examiner's interpretation of Chen is technically incorrect and one skilled in the art would not interpret Chen in the manner that the Examiner has interpreted Chen.

For example, at col. 6, lns. 25-55, Chen teaches:

> Referring next to FIG. 7, a *second spin-on-glass layer 42* is now formed over the first spin-on-glass layer 40 essentially planarizing the dielectric layer and completing the process. This second spin-on-glass *layer 42 is formed* by also using the liquid precursor of the siloxane type *similar in composition to the material used for the first spin-on-glass layer 40, but in this second coating the spin-on-glass is dispensed at a* significantly higher spin speed and at a constant speed. The *same series of spin-on-glass is used for both layers*.
>
> The substrate is again placed on a spin coater and brought to a constant rotational speed in the range of about 2500 to 3000 revolutions per minute (rpm) before dispensing the spin-on-glass and

> then the substrate is maintained at this constant rotational speed for an additional 6 seconds. The substrate is then brought to a stationary position, that is the spin speed is reduced to zero rpm and the second spin-on-glass layer is allowed to air dry at room temperature of about 25°C for an additional 15 seconds. The substrate is then baked, for example on a hot plate, at a temperature of between about 100° to 300°C for a time of between about 0.5 to 2.0 minutes. The spin-on-glass layer 42 is then pyrolzed at a relatively high temperature to form an inorganic glass. The preferred curing temperature for this last step is between about 400° to 450°C and for a time of about 20 to 30 minutes, and more specifically at a temperature of 425°C for 30 minutes thereby forming the inorganic glass. *The preferred thickness of layer 42 is between about 4000 to 6000 Angstroms* as can be seen in FIG. 7, the spin-on-glass dielectric layer fills the recesses and essentially planarizes the irregular recesses or gaps on the substrate. (emphasis added)

Hence, from this section, <u>Chen</u> teaches that preferably layer 42 has a thickness between about 4000 to 6000 Angstroms, and that the spin-on-glass used to form layer 42 is dispensed at a <u>significantly higher speed</u> (i.e. 2500 to 3000 rpm) than the speed for dispensing the first layer 40.

At Col. 6, lns. 10-24, <u>Chen</u> teaches:

> Referring now more particularly to the method of coating the substrate to form the planarizing dielectric layer over the patterned conducting layer, a first spin-on-glass *coating 40, is formed by* first bringing the substrate to a constant rotational <u>speed in the range of about 600 to 800 revolutions per minute (rpm)</u> and then dispensing the spin-on-glass liquid precursor for about 6 seconds. The spin-on-glass is then allowed to air dry at room temperature of about 25°C for another 15 second at the above constant rotational speed. The substrate is then removed from the spin coater and baked, for example on a hot plate, at a temperature of between about 100 to 300 for a time of between 0.5 to 2.0 minutes. Because of this lower and constant spin speed the recesses or gaps between the patterned conductor 34 fill more evenly, as was depicted earlier in FIGS. 3A and 3B. (emphasis added)

Hence, from this section, <u>Chen</u> clearly teaches that layer 40 is formed at a rotational speed of about 600 to 800 rpm. This is <u>significantly less</u> than the speed used to form layer 42, as shown above. This section does <u>**not**</u> recite any specifics as to the actual thickness of layer 40.

One skilled in the art, however, would clearly understand from the two above passages that layer 40 in Chen must be thicker than layer 42. More specifically, if the same materials are used for layers 40 and 42 (which they may be in Chen[1]), then it is well known in the art that the thickness of a spin coated film *decreases* as the rotational speed *increases*, i.e. the faster the rotational speed, the thinner the layer. In support thereof, Applicants are submitting an article, Dietrich Meyerhofer, "Characteristics of resist films produced by spinning," J. Appl. Phys. 49(7), July 1978, p. 3993-3997.[2] In particular, Figs. 2 and 4 in Meyerhofer clearly demonstrate that the greater the spin speed (in rpms), the thinner the film thickness.

Accordingly, if layers 40 and 42 in Chen are formed of the same materials and since layer 42 is being applied at a spin speed significantly higher than that of layer 40, layer 42 (the alleged second layer) must be thinner than layer 40 (the alleged first layer). If layers 40 and 42 are formed of similar materials (not the same materials), at the very least, Applicants assert that the thickness of layer 40 is not taught or suggested by Chen. One skilled in the art would clearly appreciate these points.

In contrast, independent Claims 1-10, 31, 33, 149, 161 and 173 of the present application specifically recite that the second leveling film is thicker than the first leveling film.

The Examiner, however, cites to col. 5, ln. 61 - col. 6, ln. 24 in Chen which the Examiner contends teaches the formation of the first spin-on-glass layer 40 as having a thickness of 2000-3000 Angstroms and as a result being thinner than layer 42. Applicants respectfully submit that the Examiner's interpretation of this section in Chen is technically incorrect and one skilled in the art would not interpret this passage in the same manner as the Examiner.

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[1] It is noted that col. 6, lns. 25-55 in Chen state that layer 42 is formed by using "the liquid precursor of the siloxane type *similar* in composition to the material used for the first spin-on-glass layer 40" and "[t]he *same* series of spin-on-glass is used for both layers" (emphasis added). However, as explained above, whether it is the same or similar material, Chen does not teach the specific thickness of layer 40 and does not disclose or suggest the claimed structure of the present application.

In particular, col. 5, line 62 to col. 6, line 9 in Chen states:

> "Now referring to FIG. 6, a first spin-on-glass layer 40 is formed over the insulating layer 36 by spin coating. The preferred material used is a spin-on-glass liquid which consist of a silicon-oxide (Si--O) network polymer dissolved in a common organic solvent, such as alcohol, ketones and esters. And more specifically the preferred spin-on-glass material is a series of siloxane base material marketed by the Allied-Signal Corp. under the trade name ACCUGLASS. The preferred material in the series being ACCUGLASS 211, 314 or 311. The primary difference between the spin-on-glass types is the viscosity (solid content). For example, the series 211 has a lower viscosity and produces a thinner coating of about 2000 Angstroms while series 314 and 311 have a higher viscosity and produce coatings of about 3000 Angstroms." (emphasis added)

In this section, Chen is merely discussing the primary difference between ACCUGLASS 211, 314 or 311, not the thickness of layer 40. This discussion is consistent with the materials provided by Honeywell regarding the Accuglass 211 and 311.[3] As shown in the enclosed Honeywell literature[4], Accuglass 211 has a thickness of approximately 2000 Angstroms *at a spin speed of 3000 rpm*, while Accuglass 311 has a thickness of approximately 3000 Angstroms *at a spin speed of 3000 rpm*. Further, the literature shows that *at slower spin speeds*, both Accuglass 211 and Accuglass 311 have a higher thicknesses.

Therefore, at a spin speed of 600 to 800 rpms as taught in Chen, layer 40 of Accuglass 211 or 311 would have a thickness higher than the thickness of layer 42 of Accuglass 211 or 311 at a spin speed of 2500 to 3000 rpms.

Hence, the passage at col. 5, line 62 to col. 6, line 9 in Chen does not support the Examiner's contention that the actual thickness of layer 40 is between 2000-3000 Angstroms. Instead, this

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[2] A copy of this reference is enclosed with the IDS being submitted herewith.

[3] As shown in the attached materials, the trademark for Accuglass is currently owned by Honeywell. Honeywell received this trademark from AlliedSignal as the result of a merger.

[4] A copy of this reference is enclosed with the IDS being submitted herewith.

passage merely discusses the differences between these materials, and if the two films are formed at the same speed, except for the difference in starting materials, the film formed from the series 211 is about 2000 Angstroms and the film formed from the series 311 or 314 is about 3000 Angstroms. As explained above, there is no specific disclosure in Chen as to the thickness of layer 40, other than what one skilled in the art could interpret based on the spin speed, and such an interpretation would have to conclude that layer 40 is thicker than layer 42.

Therefore, Chen does not disclose or suggest the claimed feature of the present application of wherein said second leveling film is thicker than said first leveling film.

The Examiner also contends that it would be a routine matter of experimentation as to choice of thickness layers. However, as explained above, Chen clearly teaches to those skilled in the art, based on the various rotation speeds, that the first layer 40 is thicker than the second layer 42. There is no disclosure or suggestion in Chen of the reverse configuration. Hence, there is nothing in Chen to suggest the claimed structure of the present application or to suggest that the claimed structure is merely routine experimentation. In fact, by reciting the specific spinning speeds above, Chen is clearly teaching away from the configuration of the claimed invention.

As none of the other references disclose this claimed feature, independent Claims 1-10, 31, 33, 149, 161 and 173 and those claims dependent thereon are not disclosed or suggested by the cited references and are patentable thereover. Accordingly, it is respectfully requested that this rejection be withdrawn.

Information Disclosure Statement

Applicants are filing an information disclosure statement herewith. It is respectfully requested that this IDS be entered and considered at this time.

Conclusion

It is respectfully submitted that the present application is in a condition for allowance and should be allowed.

If any fee should be due for this response, please charge our deposit account 50/1039.

Favorable reconsideration is earnestly solicited.

Respectfully submitted,

Mark J. Murphy
Registration No. 34,225

COOK, ALEX, McFARRON, MANZO,
CUMMINGS & MEHLER, Ltd.
200 West Adams Street, Suite 2850
Chicago, Illinois 60606
(312) 236-8500

Customer no. 000026568

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ACCUGLASS

Word Mark	ACCUGLASS
Goods and Services	IC 001. US 006. G & S: CHEMICAL COMPOSITIONS USED IN MANUFACTURING SEMI-CONDUCTOR COMPONENTS. FIRST USE: 19840221. FIRST USE IN COMMERCE: 19840221
Mark Drawing Code	(3) DESIGN PLUS WORDS, LETTERS, AND/OR NUMBERS
Design Search Code	26.17.13 - Letters or words underlined and/or overlined by one or more strokes or lines; Overlined words or letters; Underlined words or letters
Serial Number	73497946
Filing Date	September 4, 1984
Current Filing Basis	1A
Original Filing Basis	1A
Published for Opposition	July 16, 1985
Registration Number	1361262
Registration Date	September 24, 1985
Owner	(REGISTRANT) ALLIED CORPORATION CORPORATION NEW YORK COLUMBIA ROAD AND PARK AVENUE MORRISTOWN NEW JERSEY 07960 (LAST LISTED OWNER) Honeywell International Inc. CORPORATION DELAWARE 101 Columbia Road Morristown NEW JERSEY 07962
Assignment Recorded	ASSIGNMENT RECORDED
Attorney of Record	David A. Cohen
Description of Mark	THE LINING SHOWN ON THE MARK IS A FEATURE OF THE MARK AND DOES NOT INDICATE COLOR.
Type of Mark	TRADEMARK
Register	PRINCIPAL

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Trademark Assignment Abstract of Title

Total Assignments: 3
Serial #: 73497946 **Filing Dt:** 09/04/1984 **Reg #:** 1361262 **Reg. Dt:** 09/24/1985
Registrant: ALLIED CORPORATION
Mark: ACCUGLASS

Assignment: 1
Reel/Frame: 0606/0648 **Received:** **Recorded:** 06/22/1988 **Pages:** 3
Conveyance: MERGER
Assignor: ALLIED CORPORATION **Exec Dt:** 09/30/1987
Entity Type: CORPORATION
Citizenship: NEW YORK
Assignee: ALLIED-SIGNAL INC. **Entity Type:** CORPORATION
Citizenship: DELAWARE
Correspondent: ERVIN, KOPPEL & HOWARD G. MASSUNG
ALLIED-SIGNAL INC., LAW DEPT.
P.O. BOX 2245
MORRISTOWN, NEW JERSEY 07962-2245

Assignment: 2
Reel/Frame: 1093/0057 **Received:** 12/27/1993 **Recorded:** 12/27/1993 **Pages:** 9
Conveyance: CHANGE OF NAME (SEE RECORD FOR DETAILS)
Assignor: ALLIED-SIGNAL INC. **Exec Dt:** 04/26/1993
Entity Type: CORPORATION
Citizenship: DELAWARE
Assignee: ALLIEDSIGNAL INC. **Entity Type:** CORPORATION
LAW DEPARTMENT **Citizenship:** DELAWARE
101 COLUMBIA ROAD
MORRISTOWN, NEW JERSEY 07962
Correspondent: ERWIN KOPPEL
LAW DEPT
101 COLUMBIA ROAD
MORRISTOWN, NJ 07962

Assignment: 3
Reel/Frame: 2005/0860 **Received:** 01/13/2000 **Recorded:** 12/10/1999 **Pages:** 12
Conveyance: MERGER
Assignor: ALLIEDSIGNAL INC. **Exec Dt:** 12/01/1999
Entity Type: CORPORATION
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Assignee: HONEYWELL INTERNATIONAL INC. **Entity Type:** CORPORATION
101 COLUMBIA ROAD **Citizenship:** DELAWARE
MORRISTOWN, NEW JERSEY 07962
Correspondent: MARY ANN G. LEMERE
LAW DEPARTMENT
101 COLUMBIA ROAD
MORRISTOWN, NJ 07962

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Live/Dead Indicator	LIVE